
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: May 2010

Questions regarding this report should be directed to:

Bill Burkhard

California Department of Water Resources
Division of Environmental Services
3500 Industrial Blvd
West Sacramento, CA 95691

Telephone: (916) 376-9761
burkhard@water.ca.gov

TABLE OF CONTENT

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT	1
2. MONITORING RESULTS.....	2
2.1 CHANNEL WATER SALINITY COMPLIANCE	2
2.2 DELTA OUTFLOW	2
2.3 RAINFALL	3
2.4 SUISUN MARSH SALINITY CONTROL GATE (SMSCG) OPERATIONS	3
3. DISCUSSION.....	3
3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH	3
3.2 OBSERVATIONS AND TRENDS.....	4
3.2.1 <i>Conditions during the Reporting Period</i>	4
3.2.2 <i>Comparison of Reporting Period Conditions with Previous Years</i>	4
4. List of Figures	
Figure 1: May 2010 Suisun Marsh Progressive Mean High Tide Specific Conductance for compliance stations	
Figure 2: May 2010 Suisun Marsh Progressive Mean High Tide Specific Conductance for monitoring stations	
Figure 3: May 2010 Daily Net Delta Outflow Index and Precipitation	
Figure 4: May 10-yr Comparison of Monthly Values of Monthly Mean Specific Conductance at High Tide for compliance and monitoring stations	
Figure 5: Map of compliance and monitoring stations, and control facilities in Suisun Marsh	

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 8.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month May, 2010, deficiency period applied thus two of the compliance stations (i.e. S21 and S42) salinity conditions were in compliance with channel water salinity standards of SWRCB (Table 1). The deficiency standard for the month of May was determined for each compliance station by comparing the progressive daily mean of high-tide SC with respective standards. The standard for compliance stations S-21 and S-42 were 12.5 mS/cm for May. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Outflow for May 2010 ranged between 15,000 cfs and 30,000 cfs as shown in Figure 3. The largest outflow for the month was about 30,000 cfs and occurred at the start of May. Higher than usual for this time of month outflow continued and gradually drop to about 17,000 cfs by mid-month and remained stable for the later half of the month and ended the month with a higher note around 21,000 cfs. Overall, May 2010 outflow was impressive this late in the spring time when typically is dry. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for May 2010 is listed below:

Month	Mean NDOI (cubic feet per second)
May	21,063

2.3 Rainfall

Rainfall events for May 2010 were scattered between mid and later part of the month with the largest daily amount of .33 inches on May 27. Although the rainfall events were small in May, every little add on is a bonus given the fact that May is typically a dry or no precipitation month. The monthly total is shown below:

Month	Total Rainfall (inches)
May	0.98

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during May 2010 is summarized below.

Date	Gate status	Flashboards status	Boat Lock status
May 1 – May 31	3 gates held open	Out	closed

Gate operation ceased since February 27, 2009 and flashboards were removed in late April due continuing low salinity levels in the marsh and meeting salinity standards for the remainder of the season was not of concern. As such, the gates were not operated in May.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During May 2010 PDM salinity levels at all compliance stations were below 2.3 mS/cm as shown in Figure 1. The salinity at the beginning of the month was already low and remained the same throughout the month from antecedent conditions of a later and wetter spring condition. The salinity levels varies due to gradient differences between east and west but the overall conditions were extremely fresh at all compliance stations.

At monitoring stations, S-97 salinity started off low but increased to about 4.5 mS/cm before dropping as a result of rainfall events in May. S97 is highly influenced by creek flow, specifically, Green Valley Creek. As such, the salinity levels can rise and fall quickly in response to reduce or increase creek runoffs. S-35 is further away from creek runoffs and have minimal creek influences, but does get impacted by creek runoffs only through tidal exchanges. S35 is more influenced by outflow than creeks. S35 salinity level was stable throughout the month of May.

Overall, salinity levels in May of 2010 were well below the monthly standards.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for April 2010 were compared with means for those months during the previous nine years (Figures 6 and 7).

Compared to previous years, May 2010 salinity levels and patterns were similar to that of 2000. Compared to previous year, salinity levels at all compliance stations were much lower due to impressive rainfall activities in late spring to hold down the levels on into April. May 2010 also provided additional bonuses of small rainfall activities, when typically it would not rain in May. Compared to the previous years, May 2010 was ranked seventh in high Specific Conductance, thus making it the month with the fourth lowest salinity levels.

Table 1
Deficiency Period
Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations

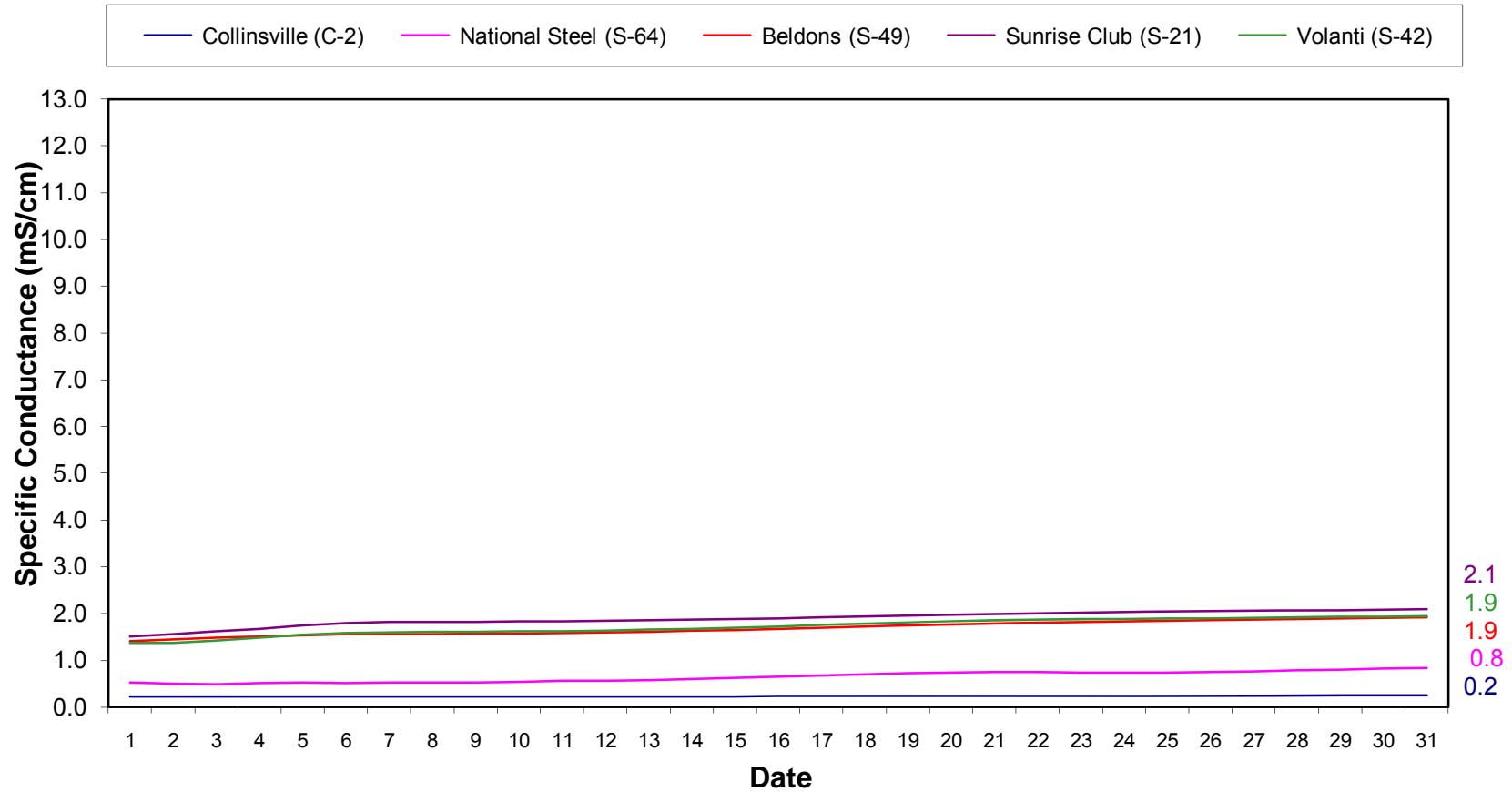
May 2010

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2	0.3	n/a	n/a
S-64	0.8	n/a	n/a
S-49	1.9	n/a	n/a
S-42	1.9	12.5	Yes
S-21	2.1	12.5	Yes

*milliSiemens per centimeter

**Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2010**

Standard = 12.5 mS/cm (S21 and S42)
Deficient year



**Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2010**

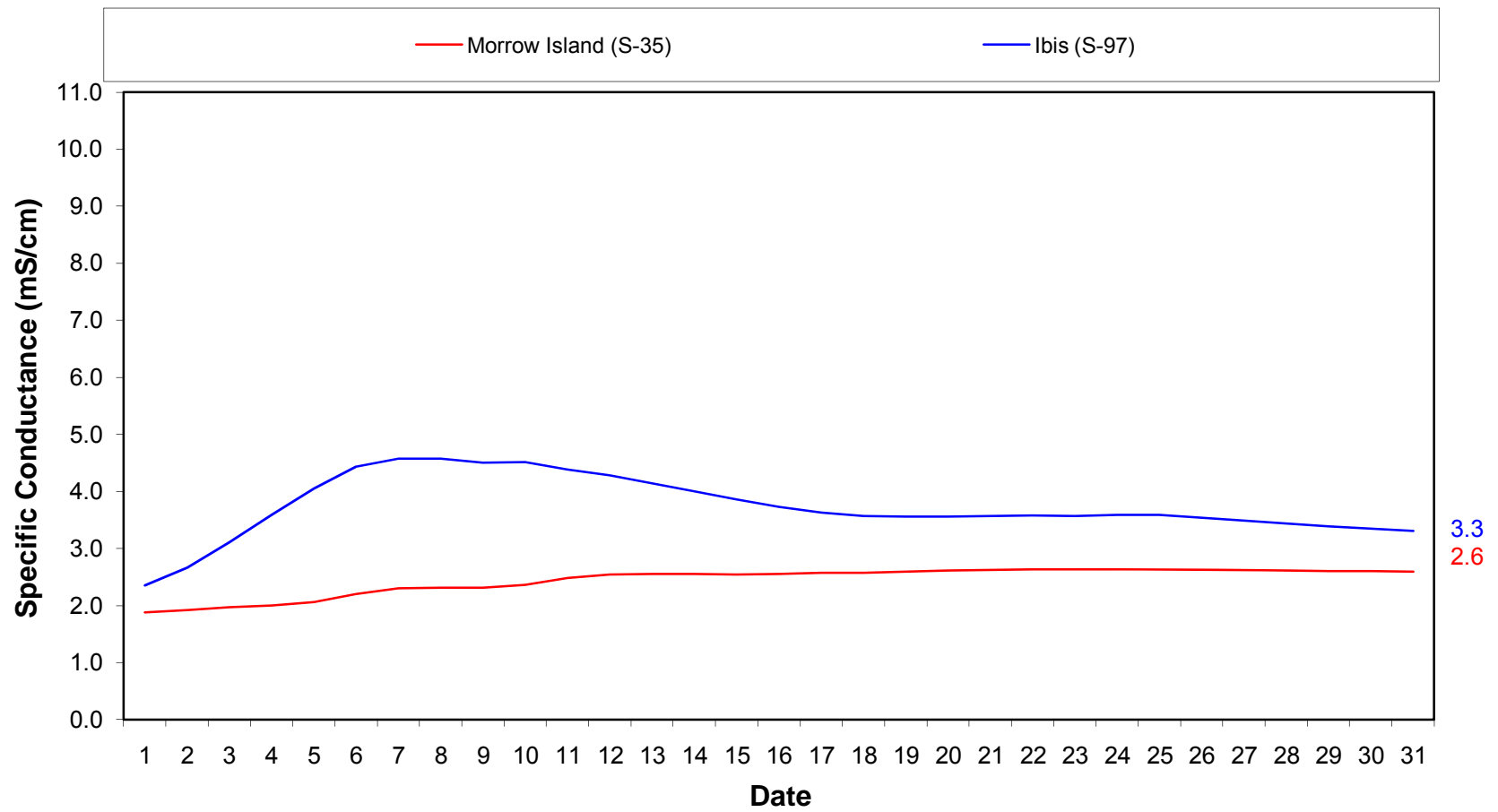
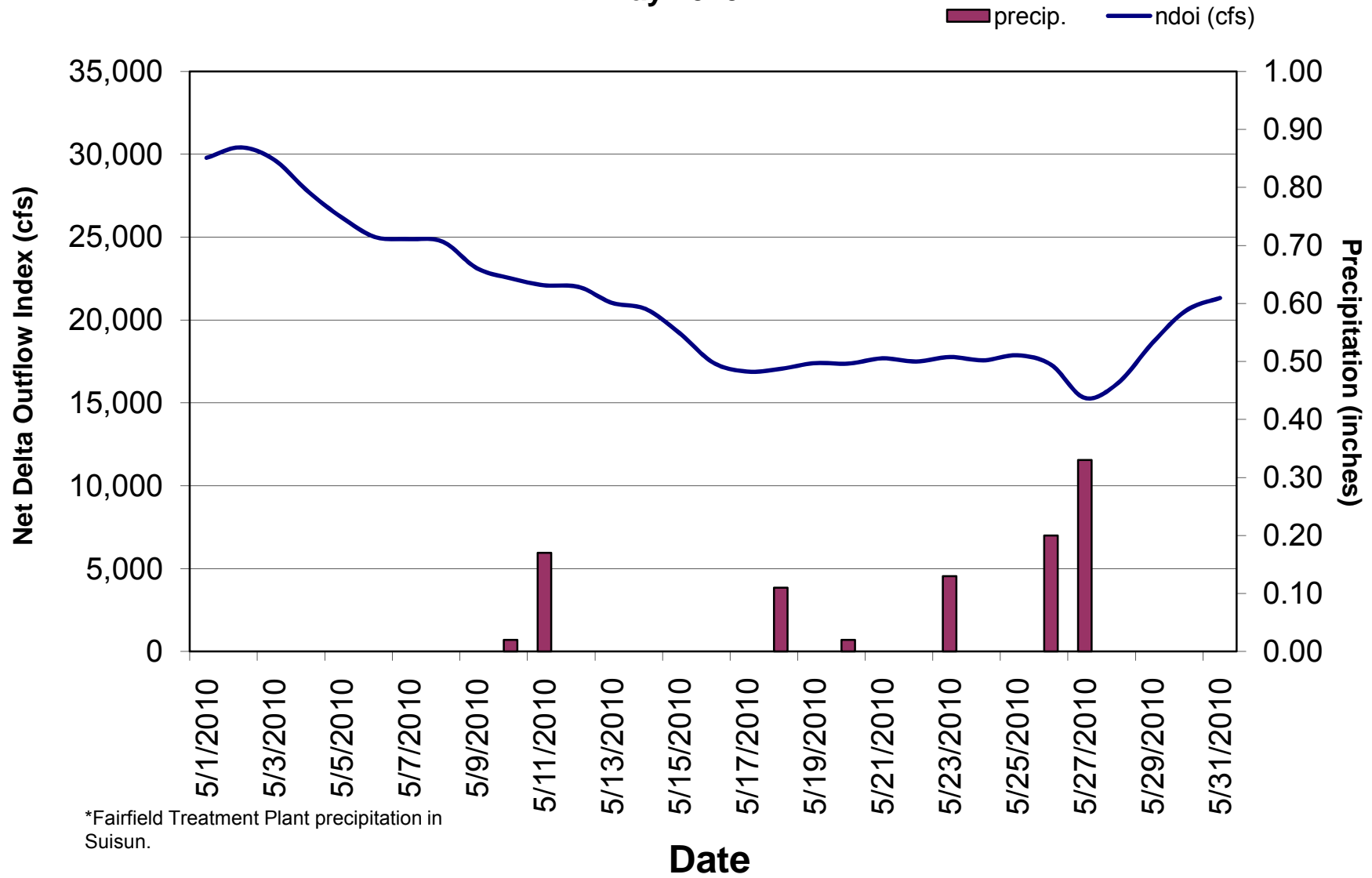
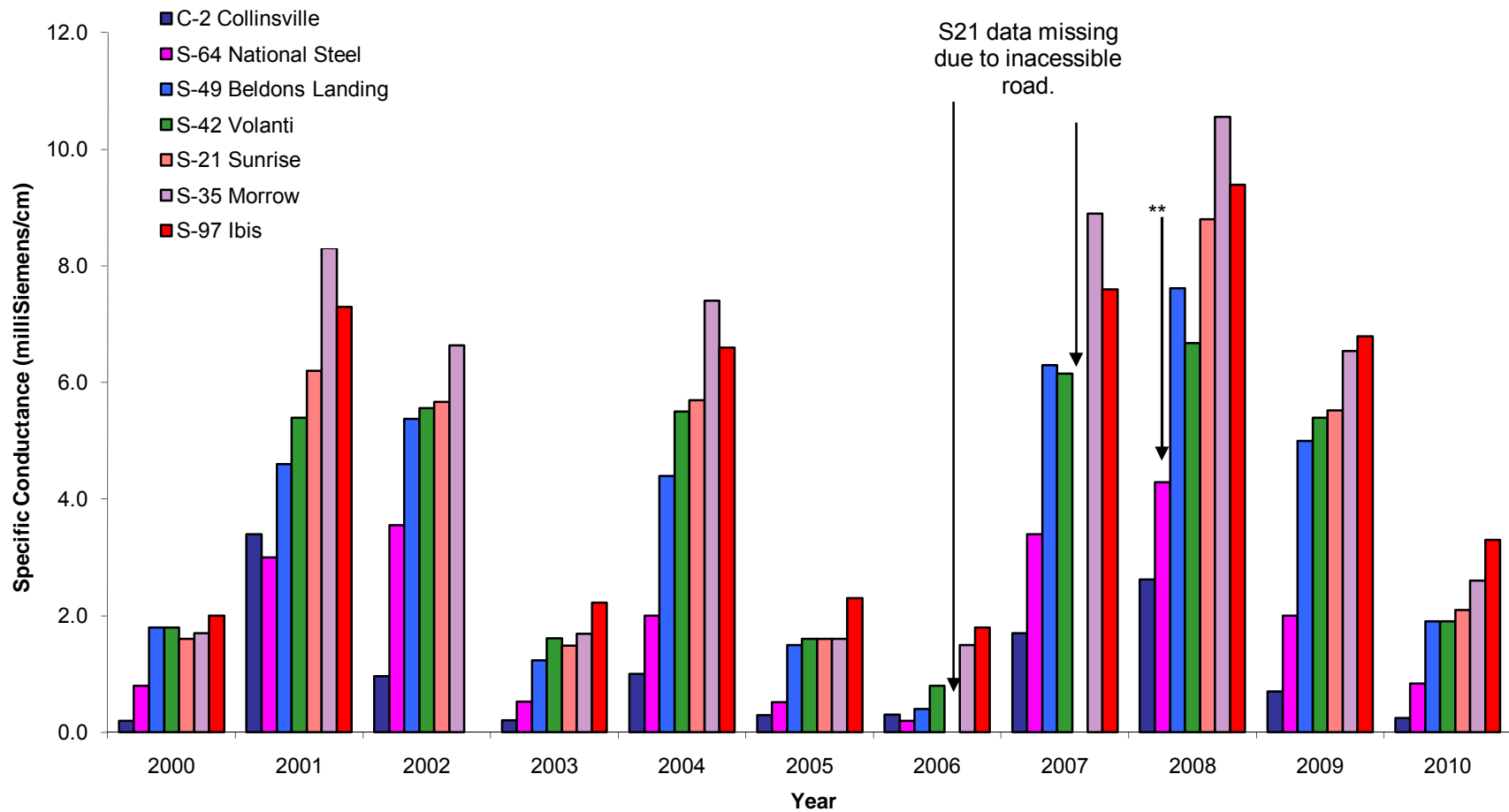


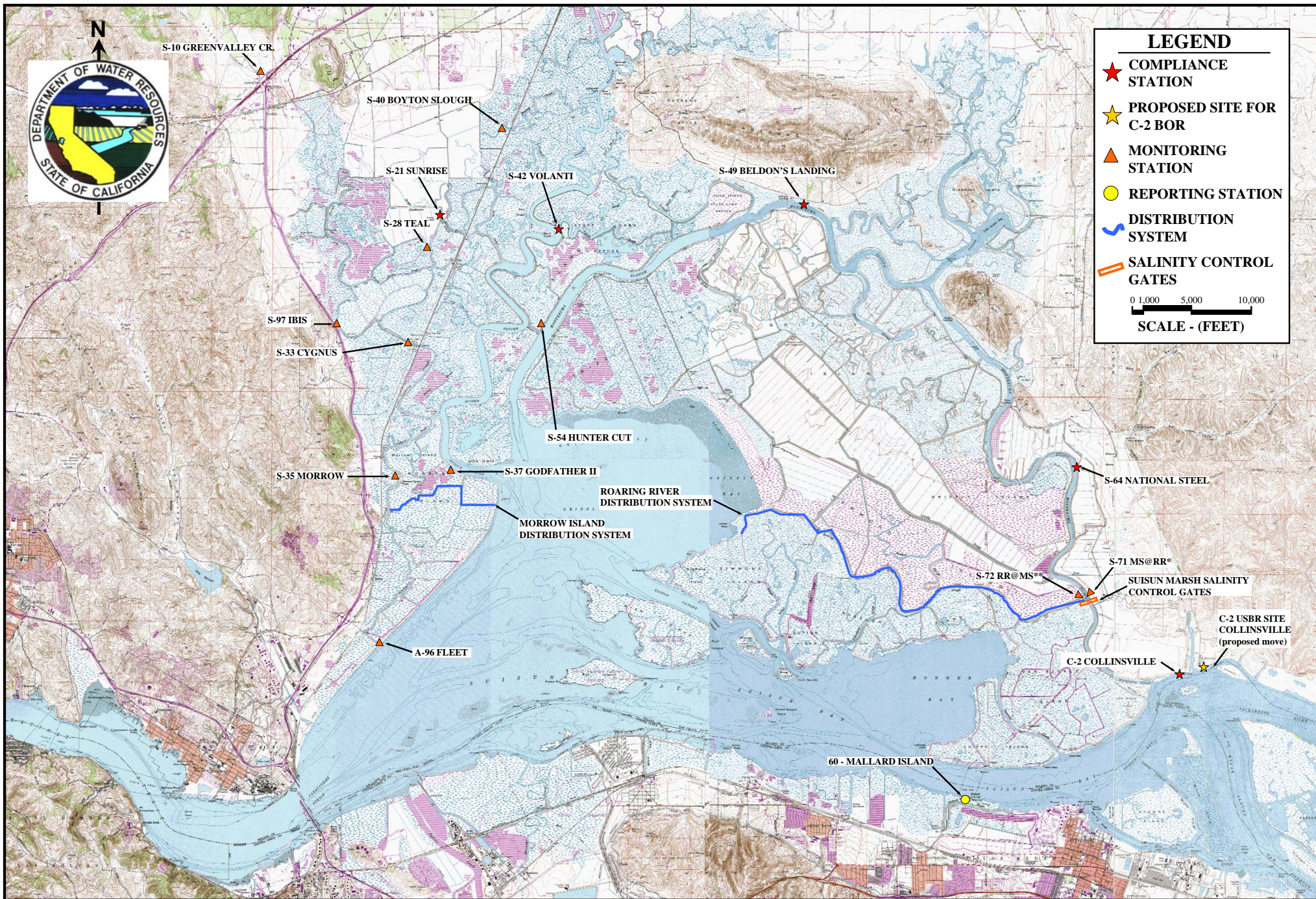
Figure 3. Daily Net Delta Outflow Index and Precipitation*
May 2010



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
May of 2000-2010**



**S64 PDM based on last good data (6/20/08).



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES